



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. 10/667,277)	
)	
Inventor: James Williams)	Tech Center 2800
)	
Title: Boron Ion Delivery System)	Ex. P. E. Perkins
)	
Filed: Sept. 19, 2003)	

Response to Restriction Requirement and Election

The above noted Restriction requirement and election was mailed on Nov. 3, 2004 and therefore this response is mailed within the 30 day response period and timely.

The Examiner has restricted the claims to eight areas which she lists in the following Groups.

- I. Claims 1-3, 6-8, 10-27, 30, 32, 35, 36, 38 and 40-45.
- II. Claims 4 and 5.
- III. Claim 9.
- IV. Claims 28 and 29.
- V. Claims 31 and 46-48.
- VI. Claims 33 and 34.
- VII. Claim 37.
- VIII. Claim 39.

For the sake of being responsive, applicant elects the claims on Group I, claims to

1-3, 6-8, 10-27, 30, 32, 35, 36, 38 and 40-45 with traverse. It is argued that the Examiner has mistakenly broken out claims 4, 5, 9, 28,29, 33, 34, 37 and 39 into Groups II, III, IV, VI, VII and VIII. Applicant argues that these enumerated claims are properly classifiable with the claims of Group I. IN fact, it is noted that all the claims of the Groups, with the exception of claims 31 and 46-48 are classified in the same class and same subclass, namely Class 438, subclass 514.

It should be noted that the method of claim 1 which uses the technique of streaming the ions on to the target utilizes the principle of plasma source ion implantation which means that the target is biased relative to the plasma so that the boron ions are extracted directly to the target from the plasma across the plasma sheath. This feature is defined in claims 47 and 48, apparatus claims, and show that the claims should not be separated out from examination with those claims of Group 1.

The Examiner argues that these Groups are distinct from each other because they area "related as subcombinations disclosed as usable in a single combination". She continues stating that " the processes defined in Groups I, III, IV, VI, VII and VII do not require the plasma to be 100% boron as in Group II".. This is inaccurate as any other feed source would be somewhat dangerous gases that require some special handling, positive flow outside venting over all connections while in use and still more protocol for some gases. She goes on to state that the process defined in Groups I, II, IV, VI, VII and VIII do not require the total electric current to be at least 0.3 amps. These are simply like dependant claims and the argument about subcombinations is not well taken.

In regard to Group II claims 4 and 5 define the beam mode which means that one does not have to separate the other ions from the boron ions before delivering them to the target and it means all ions will be delivered to the target. Thus, the features of these claims are intrinsic to the overall invention and should not be separated out.

Continuing the Examiner states that the process defined in Groups I, II, III, VI, VII and VII do not require the process to be conducted in a vacuum as in Group V as claimed. She continues stating "the process described in Group(s) sic, I, II, III, IV, VII and VIII do not require the process to be conducted at a high temperature as in Group VI". What the Examiner means by this statement is puzzling since the process requires ionization and how would one attain that goal without high temperatures? Perhaps the Examiner can offer up a solution to this dilemma. It should also be understood that the basic process requires a vacuum and 100% ionization to work so the Examiner's position is in error.

Group IV, consisting of claims 28 and 29, define an intrinsic quality of the process in that 100% ionization is obtained. This is not achieved by a static gas process and therefore cannot be obtained by anything other than the present claimed invention. The problem with a gas process is defined in the specification which discusses the problems of "pumping load associated with static gas".

Claim 31, of Group V, defines a feature intrinsic to the invention as it is only

available in the cathodic arc techniques due to the vacuum. This is important in the increasing miniaturization of circuitry and the lithographic and patterning features of the wafer becoming finer and finer.

Regarding claims 33 and 34, lumped into a Group VI by the Examiner, as the restriction of junction depth is an important factor as amorphization helps prevent inward transport of dopant by reducing the phenomenon of ion channeling in the crystal lattice. Since the instant invention uses higher dose rates than heretofore, the probability of amorphization is probable.

The Examiner states "the process described in Group(s) sic, I, II, III, IV, VI and VIII do not require using magnetic containments to direct the plasma as in Group VII".

She continues stating "the process defined in Group VII requires no toxic carcinogenic, flammable, pyrophoric or explosive feed material". To the contrary, it does require one of them to function. Claim 39 states a goal which is not achievable by any other method of generating ions. It should be noted that the qualities of claim 39 which make up Group VIII are not attainable expect for the process of Group I and the apparatus of Group V.

Group VII, consisting of only Claim 37, defines the only known process that provides both no separation magnet and no co-implanted ions in both PII and beam manifestations. The instant beam system needs no magnet and produces no impurity ions.

Group VIII, consisting on only claim 39, which defines a process of delivering ions from pure boron which is substantially non-toxic. Thus the ion implantation is available for applications such as in the medical field where you have toxicity as an issue. All other boron feed materials except the pure boron of this invention are dangerous and a goal has been to get rid of gases which are produced when non pure boron is used.

In addressing the distinction between Group I and Group V, the Examiner states that the inventions are distinct since the “ process as claimed can be practiced by another materially different apparatus OR by hand”. To support this position, she states that the plasma may be directed into the chamber using a gas pressure system. To argue that the process of Group I can be performed by hand it absurd. How would such a method be done, in detail? It is postulated that the Examiner would be hard put to come up with a plausible recitation. Further, how would the plasma be directed using a gas pressure system? The Examiner has not set forth a supporting detailed explanation. She cannot just make general allegations without support in fact, or reasonable surmise. Claims 46 to 48 describe the means of “manipulation and delivery” after generating delivery of the ions. Claim 1’s design calls for streaming and claims 46-48 call for a method of streaming thus the streaming is part of the invention.

Claim 31 defines a unique technique by which ECR microwave plasma generation is workable as it enables firing a plasma at lower partial pressures than any other technique which affords a straighter path through the sheath without collisions with residual gas atoms.

The Examiner then states that the search required for Group I is not required for Groups II, III, IV, VI, VII or VIII. Applicant takes serious issue with that position as (1) the claims are all classifiable in the same class and subclass. How one would search one of the Groups without searching Group I is a mystery to the undersigned. How do you search one Group in the same subclass without searching the other? This argument of the Examiner's is too far fetched and it is patently obvious that an easy search on all the process claims can be made.

While the Examiner notes that phone calls were made to the undersigned on October 4th and 19th, he has no record of receiving such calls and there was no message left at either his Blacksburg Office or his Northern Virginia office.

It is further noted that only James Williams is an inventor on this application as the other inventor was mistakenly added and documents were filed earlier to correct this error.

In conclusion, it is requested that the Examiner withdraw this entire restriction and election of species requirement. As all the alleged inventions are classifiable in one subclass of the same class, it is not understood why this rather tenuous requirement was brought in the first place. It seems a waste of time since the Examiner has not supported her contentions about separate inventions. Applicant works in this field and is not aware of these distinctions.

APR 18 2005

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Filed: Sept. 19, 2003)	

Honorable Commissioner for Patents
P. O. Box 1450
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Second submission of Response to Restriction Requirement

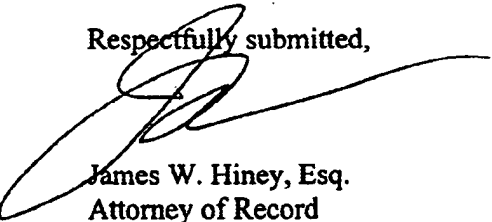
On Nov. 22, 2004, a signed copy of the response submitted herewith was filed by Express Mail No. ER 633452937 US with the United States Patent Office. A copy of the Express Mail receipt is enclosed herewith. The US Postal Service shows the delivery of the response on Nov. 23, 2004 in Alexandria, Va. 22313. A copy of the receipt is enclosed.

Evidently the mail room lost the filing as the Examiner never received it and was getting ready to abandon the case when she called the undersigned earlier this week who

told her the response was done and filed in November of last year. Since the copy of the response and receipt have to again go through the mail room they are filed herewith. It is noted that the self addressed stamped postcard attached to the filing was never received by the undersigned's office thereby affirming the possibility that the case was lost after receipt.

As this should take care of the matter, it is urged that the response be sent to the Examiner so that the prosecution of this case may continue.

Respectfully submitted,



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Certification of Mailing

I, James W. Hiney, do hereby certify that an executed original of this communication together with a copy of the November, 2004 response and copies of the Express Mail receipt and acknowledgement were deposited, Express Mail No. ED 114661298 US, with the United States Postal Service this 15th day of April, 2005.



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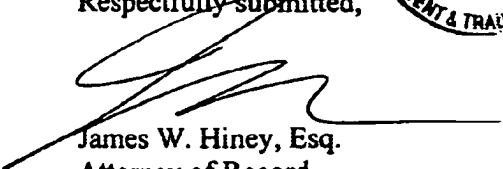


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Respectfully submitted,




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Certificate of Mailing

I, James W. Hiney, do hereby certify that an executed copy of this Response was deposited, Express Mail Postage Prepaid, No. ER 633452937 US, with the United States Postal Service, this 22nd day of November, 2004, addressed to the Commissioner of Patents, P. O. Box 1450, Alexandria, VA 22313-1450.


James W. Hiney